openreach

STIN 1005

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Suppliers' Trial Information Note

For The Openreach Network

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This document is issued for Communications Provider reference during the Uninhabitable Locat and Ruggedised ONT Pilot. Following successful conclusion of the Pilot the contents of this document will at a future date be added to the main FTTP SIN506 document if launched.

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CONTENTS

1. INTRODUCTION 3
2. THE RUGGEDISED ONT 3
3. PHYSICAL CONNECTIVITY 4
4. POWER 5
4.1 EARTHING AND POWER REQUIREMENTS FOR CP 5
4.2 PSU SPECIFICATIONS 6
5. LEDS 9
6. HEAT REQUIREMENTS 10
7. SPACE 10
8. FTTP PRODUCT INFORMATION 11
9. ABBREVIATIONS 12
10. HISTORY 13

1. Introduction

This STIN presents a new ruggedised Gigabit Passive Optical Network (GPON) Optical Network Termination (ONT) unit which is intended to be deployed and operate within uninhabitable premises, in which the physical environment, such as temperature and moisture, generally is more extreme than what the existing suite of residential Openreach ONTs are designed for.

The external interfaces to the ruggedised ONT unit - being input DC power, GPON fibre connection and Ethernet connection - are offered as standardised lengths of cables (referred to colloquially as 'tails') that terminate upon environmentally hardened interfaces.

2. The Ruggedised ONT

The components of the ruggedised ONT are shown below.

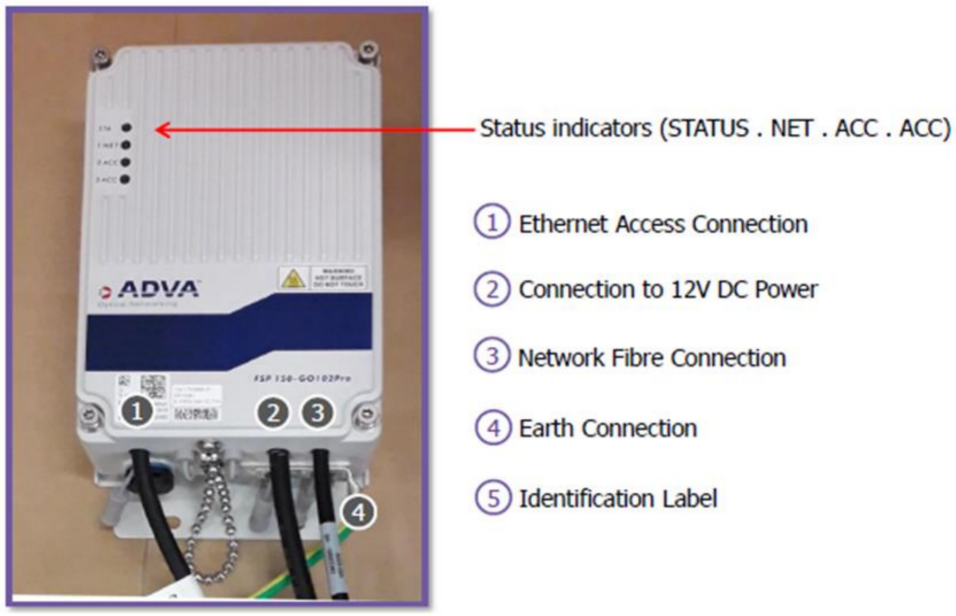

Status indicators (STATUS . NET . ACC . ACC)
1 Ethernet Access Connection
2 Connection to 12V DC Power
3 Network Fibre Connection
4 Earth Connection
5 Identification Label
ADVA

Figure 1

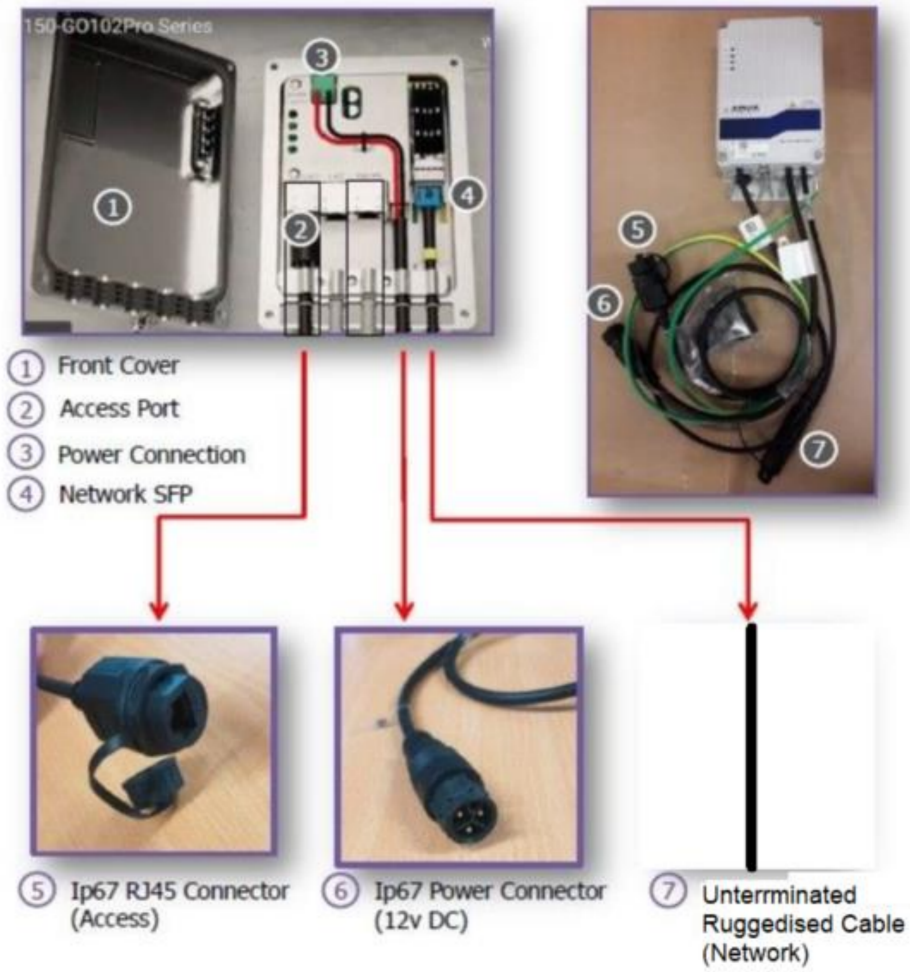


Figure 2

3. Physical connectivity

The network side single fibre working connection is made with a ruggedised fibre tail which is unterminated, so that it can be spliced into the small splicing box used to connect with the onward network fibre back to the exchange.

The access side 1000Base-T connection is made use the ruggedised Amphenol RJ45 connector. Figure 3 shows the connection presented from the ruggedised ONT, and

Figure 4 shows the presentation that must be made from the customer, by adding the components shown to the customer's RJ45, so it can partner with the end presented for the ruggedised ONT.

Figure 3

Figure 4

4. Power

The ruggedised ONT is locally powered via an AC to DC converter that must provide 12V DC and the maximum continuous power taken by the ruggedised ONT is 13W, SELV source only.

The Communications Provider (CP) will provide a DC power supply unit (PSU) which they are responsible for installing prior to installation of the ruggedised ONT. The CP is also responsible for providing the AC to DC converter and maintaining the PSU.

4.1 Earthing and power requirements for CP

The applicable wire gauge for the 12volt DC feed is minimum AWG 18 (0.823mm2).

The ruggedised ONT must be earthed to ETSI EN 50310 standard, using the Earthing lead provided with the NTE. The earthing lead (ground wire) used on the Ruggedised ONT must be a minimum of AWG 10 (5.26mm2) for installations within street furniture or inside mounting.

The DC lead on the PSU uses AWG 18.

The ruggedised ONT is fitted with an AWG 10 earth lead which is suitable for all the recommended deployment locations (inside a pole, street cabinet, street furniture, indoors etc.).

It will be responsibility of the street furniture owner to ensure:

a) The furniture is earthed according to an acceptable standard ETSI EN 50310
b) Any metallic exterior should be bonded to earth.
c) The earth is tested prior to connection of any Openreach equipment. Openreach will not connect unless the earth is proven to be good. Bonding earth check should be undertaken as shown in below label.

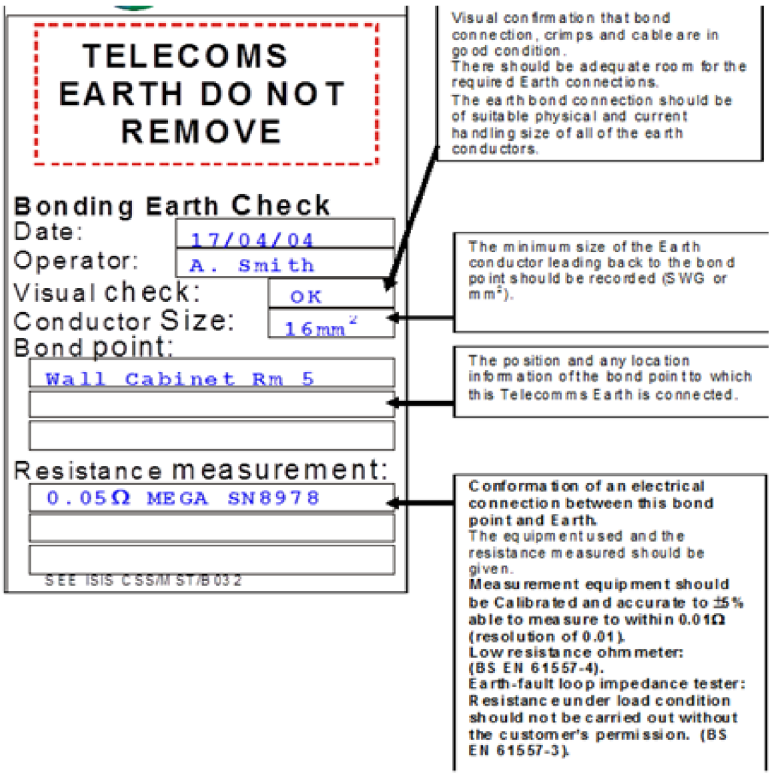

TELECOMS
EARTH DO NOT
REMOVE
Bonding Earth Check
Date: 17/04/04
Operator: A. Smith
Visual check: OK
Conductor Size: 16mm²
Bond point:
Wall Cabinet Rm 5
Resistance measurement:
0.05Ω MEGA SN8978
SEE ISIS CSS/MST/B032
Visual confirmation that bond connection, crimps and cable are in good condition.
There should be adequate room for the required Earth connections.
The earth bond connection should be of suitable physical and current handling size of all of the earth conductors.
The minimum size of the Earth conductor leading back to the bond point should be recorded (SWG or mm²).
The position and any location information of the bond point to which this Telecomms Earth is connected.
Conformation of an electrical connection between this bond point and Earth.
The equipment used and the resistance measured should be given.
Measurement equipment should be Calibrated and accurate to ±5% able to measure to within 0.01Ω (resolution of 0.01).
Low resistance ohmmeter: (BS EN 61557-4).
Earth-fault loop impedance tester: Resistance under load condition should not be carried out without the customer's permission. (BS EN 61557-3).

Figure 5

4.2 PSU specifications

The CP is responsible for providing the PSU to power the ruggedised ONT (similar to below) and for its UMSUG registration.

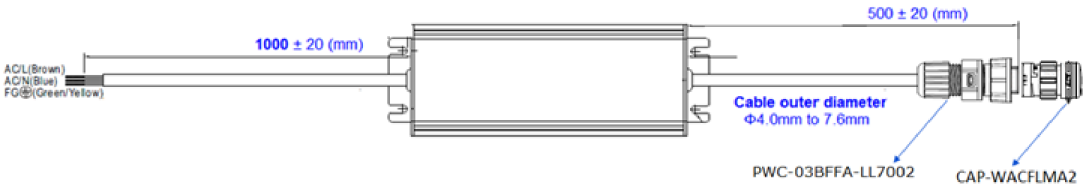


Figure 6

The connector type for the 12V DC connection that the customer must present at their PSU (to mate with the ruggedised ONT) is a female Amphenol TW connector: PWC-03BFFA-LL7002 as shown below:

Power Connector: Amphenol LTW brand (PWC line)
20A rated, IP67, -20C - +80C

Figure 7

The PIN-out diagram above for the electrical 12vdc PSU, refers to the female Amphenol TW connector: PWC-03BFFA-LL7002 that should be presented from the customer provided PSU.

The CP is responsible for making sure the PSU meets all necessary safety, environmental, emissions and immunity requirements relevant for the deployment site.

The DC output to the Ruggedised ONT must meet the following minimum electrical characteristics:

Customer provided PSU Output Characteristics

Item	Technical Requirement	Unit
Output voltage	12	V
Tolerance	±3%	%
Output Power	≥30	W
Efficiency	≥85	%
Ripple, Noise, and discrete frequency noise	±250	mV
Holdup-Time	≥ 16	mS

PSU Protection Characteristics

Item	Technical Requirement
Output overvoltage protection point	Yes
Output over-current protection point	Yes
Short circuit protection	Yes
Over temperature protection	Yes
Fire protection	Yes

The PSU provided shall be compliant with the following EU Directives and be appropriately CE marked. Evidence of compliance (for example DoC) shall be provided to Openreach:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- Restriction of Hazardous Substances in Electrical and Electronic Equipment - Directive 2011/65/EU

The Ruggedised ONT is compliant to Electrical surge protection EN 61000-4-5 standard.

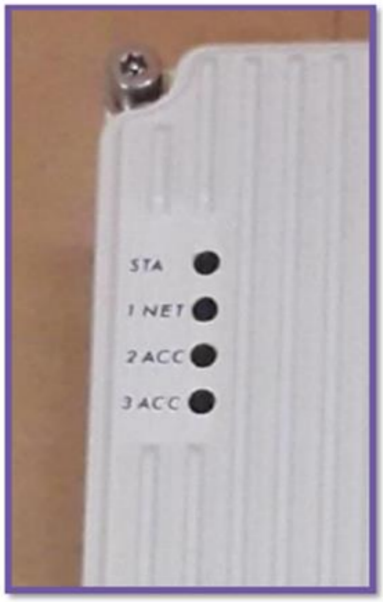
5. LEDs

The ruggedised ONT has four LEDs, for a healthy circuit the STA (Status) should be green. The "1 NET" LED must be illuminated green to indicate a network fibre up with the OLT. The "2 ACC" LED should be illuminated green to show an active connection with the customer.

LED	Colour and Meaning
STATUS	GREEN= NTE OK RED=NTE fault FLASHING AMBER=software upgrade
Network port 1 (1 NET)	GREEN=Up RED=Down AMBER=Far end Customer down FLASHING AMBER=Loopback
Access LAN port (2 ACC)	GREEN=Up RED=Down FLASHING AMBER=Loopback OFF=Not in use
Access LAN port 2 (3 ACC) is disabled and not available	OFF=Not in use

Status (STA)

- NTE OK
- Software Upgrade (Flashing)
- NTE Fault



Network Port (1 NET)

- Up
- Far end customer down (Solid)
  Loopback (Flashing)
- Down

Access Port (2 ACC)

- Up
- Loopback(Flashing)
- Down
- Not in use

Figure 8

6. Heat Requirements

The maximum system internal temperature is 60°C.

7. Space

The dimensions of the remote NTE are 100mm x 145mm x 65mm (W x H x D) and it weighs 0.75 kg.

Sufficient space will be required around the unit to allow mounting.

8. FTTP product information

The ruggedised ONT will support all Openreach FTTP products up to and including 1Gbps and conforms to the product behaviours detailed in the Openreach FTTP SIN506[1] with the following exceptions:

- The service is currently not transparent to the following, future iterations of the service will look to align fully with FTTP:
  - NTP frames with a multicast destination address
  - OSPF frames with a multicast destination address
  - IGMP over PPPoE
  - IGMP encapsulated in a VLAN (1-4094) at the ONT LAN port
  - Any traffic encapsulated in VLAN 101 on ingress to the Ruggedised ONT LAN port
- Option 82 information will not be inserted into DHCPv4 or DHCPv6 packets encapsulated in a VLAN (1-4094) on ingress to the Ruggedised ONT LAN port
- Circuit ID and Remote ID will not be inserted into PPPoE packets encapsulated in a VLAN (1-4094) on ingress to the Ruggedised ONT LAN port

Also, the Ruggedised ONT will not support the GEA multicast service (SIN503[2]).

9. References

[1] SIN 506 Suppliers' information notes (SINS) (openreach.co.uk)

[2] SIN 503 Suppliers' information notes (SINS) (openreach.co.uk)

10. Abbreviations

AWG	American Wire Gauge
CP	Communications Provider
CPE	Customer Premise Equipment
DC	Direct Current
FTTP	Fibre to the Premises
GPON	Gigabit Passive Optical Network
IPR	Intellectual Property Rights
RJ45	Registered Jack 45 – data jack that can be used for Ethernet connectivity
MCB	Miniature Circuit Breaker
NTE	Network Terminal Equipment.
NTP	Network Time Protocol
LC	Lucent Connector – Miniaturised version of SC connector with 1.25mm ferrule
LED	Light Emitting Diode
NTP	Network Timing Protocol
ONT	Optical Network Termination
OSPF	Open Shortest Path First
PSU	Power Supply Unit
SELV	Safety Extra Low Voltage (<=60V DC)
SIN	Suppliers Information Note
STIN	Suppliers Trial Information Note (BT Publication)
VLAN	Virtual Local Area Network
LLF	Link Loss Forwarding
MDI-X	Medium Dependent Interface Crossover

11. History

Issue	Date	Changes
Issue 1.0	28 June 2024	First issue
Issue 1.1	19 July 2024	Section 8 updated with performance exceptions and reference to SIN503
Issue 1.2	22 August 2024	Section 8 updated with further detail

-END-